Haunted Seas VR:Vision Therapy Adventure Game

Game Design Document

Game Overview

Title: Haunted Seas
Platform: Oculus Rift
Genre: Children's adventure game
Rating: (8+) E
Target: Children with CI

Haunted Seas is a vision therapy game in virtual reality (VR). In this VR game, users with Convergence Insufficiency Syndrome (CI), are exploring a magical world as a pirate captain. Users destroy enemy ships, capture, heal and save magical creatures, explore other realms, all while undergoing intense vision therapy.

Main interactions are done via the user's eye movements. In making the core interactions centered around eye movements, the vision therapy is woven into the gameplay. In this VR game, users' eyes are

the main controller. Because the user is given special powers when entering this world, he/she can manipulate, place, move, and even grab objects.

By doing this, the vision exercises are transformed into gameplay, where the user is directly interacting with the virtual world. By the end of the game, users have fought monsters, saved creatures, and looted enemy ships while excelling in their therapy, one level at a time.

Unique Selling Points

- Immersive environments and gameplay
- Gamified and modernized form of vision therapy
- Eye movements are main interactives
- Engaging interactions

Synopsis

A notorious pirate crew has been cornered by the British Royal Navy and is about to surrender, until they are approached by a sea creature who offers them a deal. The crew can travel to her world where they can help defeat a monster invasion. If they take her bargain, she will reward them with special powers to protect them from all enemy fleets. If they do not take her bargain, she will not help them and they will have to surrender to the Royal Navy. The pirates take the creature's bargain and agree to help her defeat the monster invaders.
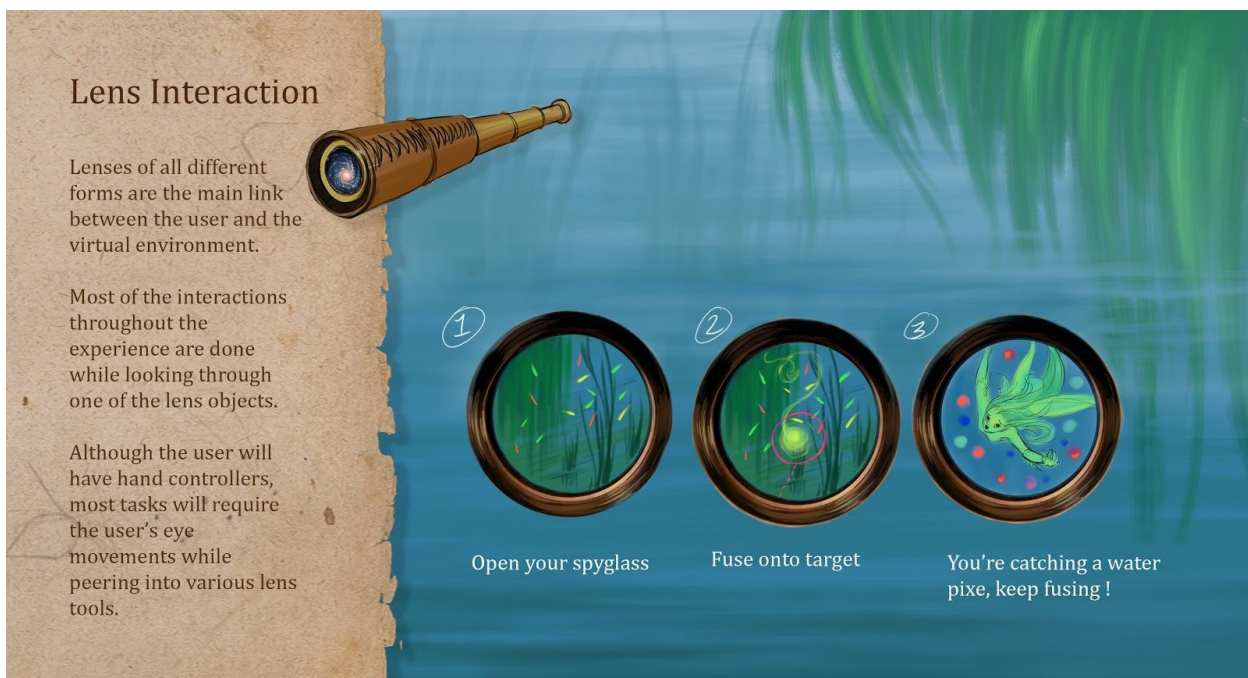
Game Objectives

The objective of the game is to travel to all 4 kingdoms within the world of Vedere and defeat the monster kings within each. Users have to free creatures enslaved by the monsters and get them to join their pirate crew. Once enemies are defeated, users can loot them and take magical weapons, maps, or stolen artifacts.

Therapy Objectives

The user must have completed each weekly therapy session successfully. This means that the user must be able to hold their "fuse" on a target for 3 seconds without losing focus or vision blurring. By the end of therapy, users should be able to read without losing focus or getting headaches. Images and text should appear clear to them, even at a close distance.

Lens Interaction

Lenses of all different forms are the main link between the user and the virtual environment.

Most of the interactions throughout the experience are done while looking through one of the lens objects.

Although the user will have hand controllers, most tasks will require the user's eye movements while peering into various lens tools.

① Open your spyglass

② Fuse onto target

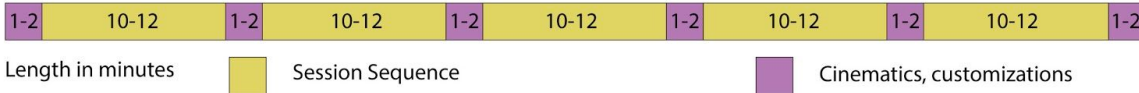③ You're catching a water pixe, keep fusing !
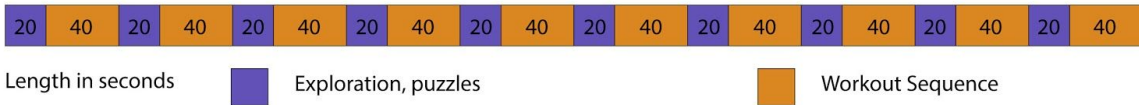
Vision Therapy

The therapy practiced for CI traditionally involves a method called the Brock String. This method involves the vision therapist and the patient each holding an end of string with beads. Each bead is placed at a particular distance away from the other, and the vision therapist instructs the patient to look at one bead at a time, by crossing their eyes. This therapy is repeated over the course of anywhere from 2-6 months, depending on the severity. Each session is once a week for 1 hour. This table below describes the 1 hour therapy session in further detail:

Therapy Sequence: Avg therapy session is one hour, interactive breaks for resting eyes

| 1-2 | 10-12 | 1-2 | 10-12 | 1-2 | 10-12 | 1-2 | 10-12 | 1-2 | 10-12 | 1-2 |

Length in minutes   ■ Session Sequence   ■ Cinematics, customizations

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Workout Sequence: Avg Workout is 40 seconds, can range from 20-60 seconds.
Rest periods in between workouts are between 10-30 seconds,
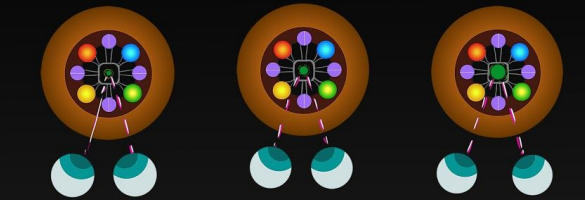depending on patient needs and are filled with exploration and puzzle quests.

| 20 | 40 | 20 | 40 | 20 | 40 | 20 | 40 | 20 | 40 | 20 | 40 | 20 | 40 | 20 | 40 | 20 | 40 | 20 | 40 |

Length in seconds   ■ Exploration, puzzles   ■ Workout Sequence

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Workout Sequence: Avg workout is 10 exercises, workouts can range from 5-15 exercises

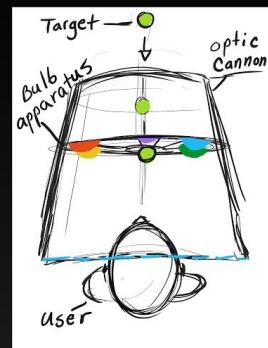| 3 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 3 | 1 | 3 |

Length in seconds   ■ Rest Period   ■ Fusing Exercise
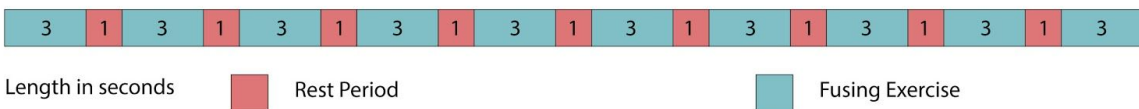
Core Mechanics

Optic Cannon/ Brock String: User Flow

1) User fuses on target
2) Target moves closer as user continues to hold fuse.
3) Target is almost through the opening
4) User still holding fuse, moves target into corresponding bulb with their eye movement
5) Target is almost placed, user is still fusing
6) Success! User has dropped the target into correct blulb with his/her eye movements and consistent fusing.

Top-down view of Optic Cannon gameplay in VR

Target — optic Cannon — Bulb apparatus — user

The core mechanic only requires eye tracking. Hands and arm movements are not needed at all for these interactions.

We have turned fusing into a game mechanic itself by giving the player the incentive to hold on throughout the exercise because there is a reward if they do it. There is incentive to go through with the 10 *back and forth* reps because if they do not follow through, they will not get their elemental which they need in order to progress in the game. They want to get to the blue world where they can meet the mermaid who will give them that clue and that special elemental power needed.
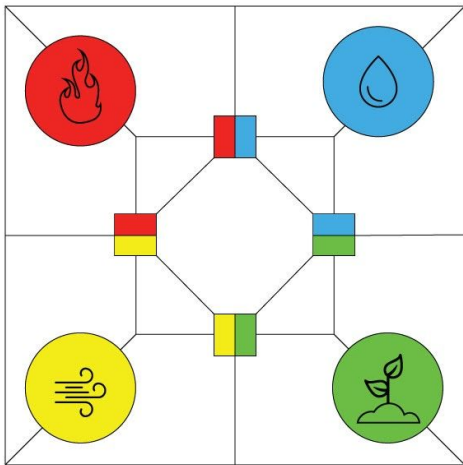
Patient Compliance & Home Therapy
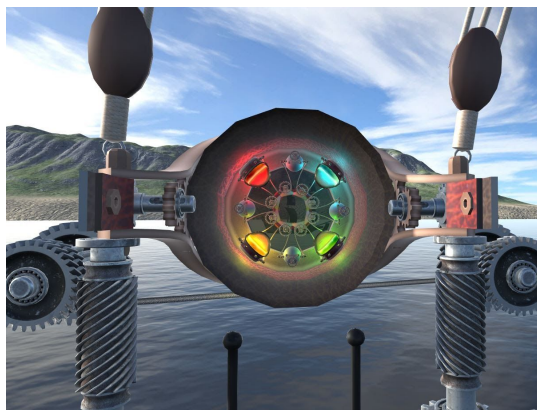
Vision therapists and parents struggle to get the child to do their home therapy between office visits. According to interviews with vision therapists, parents, and young patients, the therapy is painful and boring. Pain and boredom are difficult for most to feel motivated but with children, this seems to be even more difficult.

To aid in home therapy, young patients might be more willing to do their home therapy if it was more engaging. Interviews with vision therapists and parents revealed that children would be more willing to do their home therapy if it had an element of engagement and real-time feedback.

Focus Group Session with users between 6-12 yrs old

Haunted Seas Comic

To keep young patients involved in their therapy, a comic series is being created. The series is about the world and characters who the users are playing in their VR therapy game. Using another CI vision therapy technique, users will look for hidden messages within the text bubbles of each page.

This interactive draws directly from a vision therapy technique where users have to read a list of words out loud to the vision therapist while looking through various lenses.
The story involves the user needing to decode a message within each issue. This is how the therapy method is being gamified within the comics.

After each office session, the vision therapist would give the patient the next comic issue. The following week, the patient would tell the vision therapist what the decoded message was. This is a subtle way to check if the patient did their home therapy, without being authoritative or intimidating.

Player Characters

The player will have very little opportunities to view themselves in the game. Ways for the player to view their own avatar can greatly contribute to the fun and immersion. While the player collects these elementals, they gain points. After a certain number of points, the player can reward themselves by upgrading their costume, accessories or even weapons. This plays into the storyline where the player gradually develops into a pirate queen or king.

Possible ways for the avatar to be visible:

- Walking past various reflective objects in each level. This can be a fun, surprise element in the game
- The player is transported into their "Captain's Quarters," where there is a mirror/dressing room setup
- The player comes across a mirror which they keep in their inventory or earns it as a reward after completing a level

★ **For this game model, we need to include, saving user data so that the patients/players continue with the customizations they did to their avatar, inventory, creatures, and crew.** The patient/player will have the ability to sign in at the beginning of each session. During the first session, the patient/player will choose their name, avatar, and costume. This adds to the immersion of the experience. Patients/players will sign out at the end of each session and can pick up where they left off on the following week.

Magical Properties of Vision Devices

Within each of these steampunk vision devices, is another 4 worlds in which the elemental creatures live after you capture them. At this time, we have a *telescope* and we have the *optic cannon.* There are 2 of these telescope cannon contraptions, one on each side of the boat. The player uses this when they are a pirate captain aboard this mythical ship, and need to use elemental power in order to gain specific abilities. The player looks through the cannon and finds a large lens with 4 glowing bulbs around the focal center point. This is the contraption that the player uses to fuse onto the elemental in their sight and if successful, they are able to capture this specimen and place it via gazing, into the correct glowing bulb. The player is able to use these elemental creatures to use their magical powers and abilities.

When the player calls upon these elementals, they rush out of the telescope and into the area of activity. When the activity is over, they rush back into the telescope habitat and wait until they are needed again. Your elementals must be kept happy and healthy in order for you, the pirate captain, to successfully navigate through this world intact.

Tools (reference - Museum of Vision)

The telescope is used as the main vessel for capturing and holding the elementals, however, you acquire an arsenal of different vision tools throughout the game. This offers the player a more customizable experience throughout the span of the game These are some actual vision tools used during the 17th-18th centuries:

- Lorgnette
- Scissor Spectacle
- Martin's Margins
- Spectacles - 1800's with "C" bridge
- Telescope Monoculars
- Opera Cane
- Monocular - small handheld telescopes; can be found on perfume bottles, compasses, pendants

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Creatures/Elementals

The Creatures vary from pixie like things to demon creatures. Along your journey, you will encounter many other mythical creatures, (NPC quest givers), who will grant you advice, clues, or spirits to guide you on your quest.

Each creature is an elemental from one of the 4 elements. Each element has certain abilities and is of a certain color family. These elementals' abilities are harnessed in order to bring about certain outcomes or solve certain puzzles in the game.

- Water - Healing, intuition, clues
- Fire - Attack, power, fighting
- Air - Movement, speed
- Earth - Food, health, fuel

For example, your ship may have been damaged from the demons' attack and you need to fix it. You will need the *healing abilities of water* and the *wind abilities of air*, in order to heal the damage and get mobility for your ship to continue your quest.

Some elementals may not like each other if their abilities clash (fire and water), and will refuse to work together and cooperate. Other elementals adore each other and are friends or distant relatives. The gamification comes into play here; you must capture as many of these elementals as you can, but you must also try to catch the *right ones at the right time, for the right job.*

As the game continues (utilizing "string of pearls," linear narrative), the range of elementals that you can catch expands. You are deeper into the game, have caught one of each elemental/color, and have acquired enough power to draw in the more rare, sought after, and powerful elemental creatures. As the notorious pirate who you are, you crave this and capturing these rare, beautiful specimens becomes another goal.

- Each creature is from one of the 4 elemental family kingdoms. There may be 20 different types of fire elementals, some are very rare and possess strong powers or clues. Others are common and possess a minimal amount of power.

- Different species are attracted to different things and need to be caught in various ways.

The numbers of each elementals/colors dictates what you are able to catch; for example, if you have 6 yellows and only 2 reds you cannot yet capture that rare, beautiful elemental from the fire realm. This

gives the player incentive because each exercise is a potential for capturing the right colors that they need to achieve this goal.

The elementals that you catch are completely randomized. You may find yourself sailing through the isle of Volcanic Islands and can see a flurry of different elementals in front of you but you can only fuse on 1. You may want the water/blue elemental because you need healing after a previous battle, but during the exercise, you were not able to fuse on that elemental long enough and so now you have an earth/green elemental. So you try again in the next rep and maybe this time, you're able to fuse on the water/blue elemental and now you have what you needed! Your health goes up and you have been rewarded.

The Need for NPC Human Characters

Having other human characters (in this case, your crew), is important in order to contribute to the immersive experience. People experience situations and emotions by watching those of the people around them. How we react to the world around us is often reflected in the reactions of others. Take movie theaters for example; part of the fun of seeing a movie in a theater is sharing that experience with other people. Public spectacles are interesting because people's reactions feed off each other.

Another reason why human characters are important in this experience is because the need for the patient/player to form an emotional connection with the experience is crucial to their performance in the therapy. This experience/game, must be important and immersive enough that the patient/player, wants to fight through each exercise and beat the game. The story, the characters, and the gamification are all contributing factors in this and none of them can be eliminated.

We also want to positively affect how the patient/player sees themselves throughout their journey in this therapy and the experience. Creating a way to contribute to building confidence in the patient is crucial. Any way that we, as game designers are able to help in this way must be utilized because if the patient/player has no confidence or hope within themselves to complete the therapy or be successful in it, then the incentive to complete the therapy may diminish.

Adding human characters to this experience will create a bond between the patient and the avatar and further immerse the patient/player into the world we are creating for them.

The End

Once you have found all of the elementals who were displaced after the opening of the telescope, you are rewarded by the elemental king, who gives you your eye back. Through your journey, you have made friends with all of the elementals who you captured and released. Among these elementals, one in particular became your best friend. This elemental stays with you as your sidekick for life. You, the pirate captain, have beaten the odds and earned the ranking of pirate king or queen. After this challenging journey, you have learned how to accept yourself and overcome the most intimidating obstacles, despite your flaws and weaknesses. The story resolves with you and your new elemental friend taking off on a journey to a whole other world.