

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

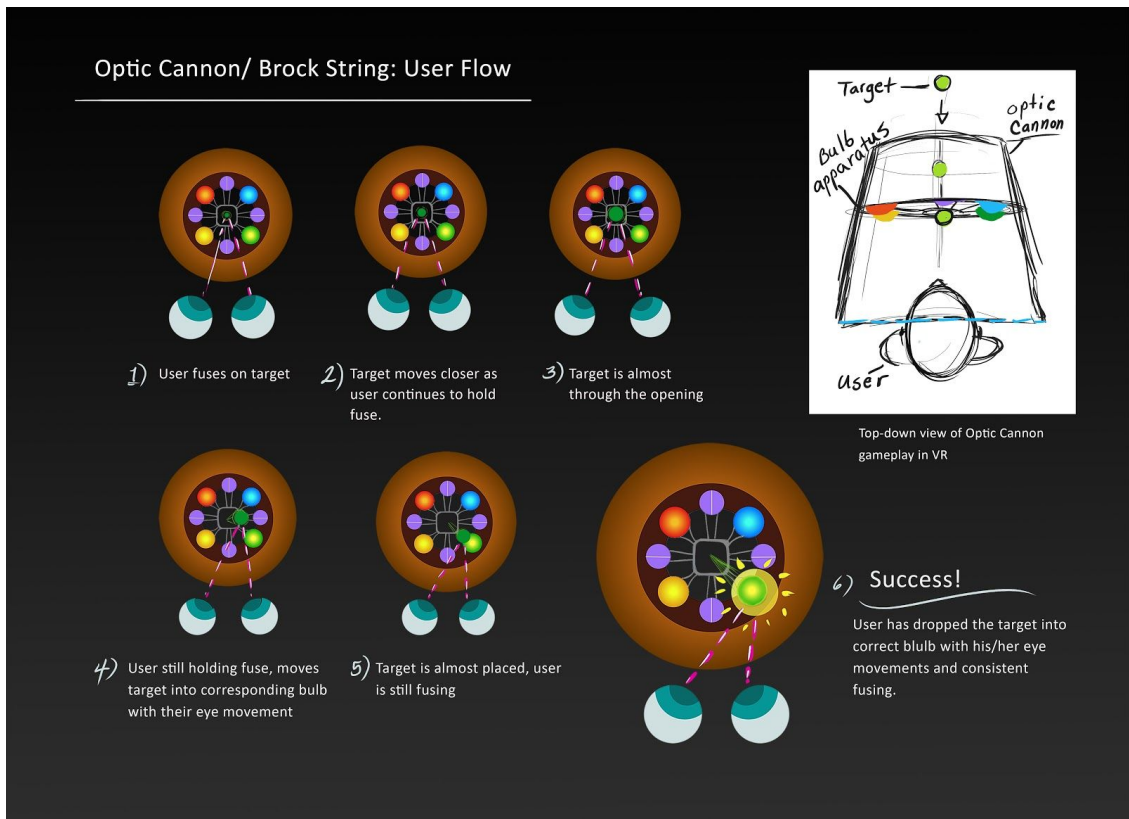
- Immersive environments and gameplay
- Gamified and modernized form of vision therapy
- Eye movements are main interactives
- Engaging interactions

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.



Core Mechanics



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.

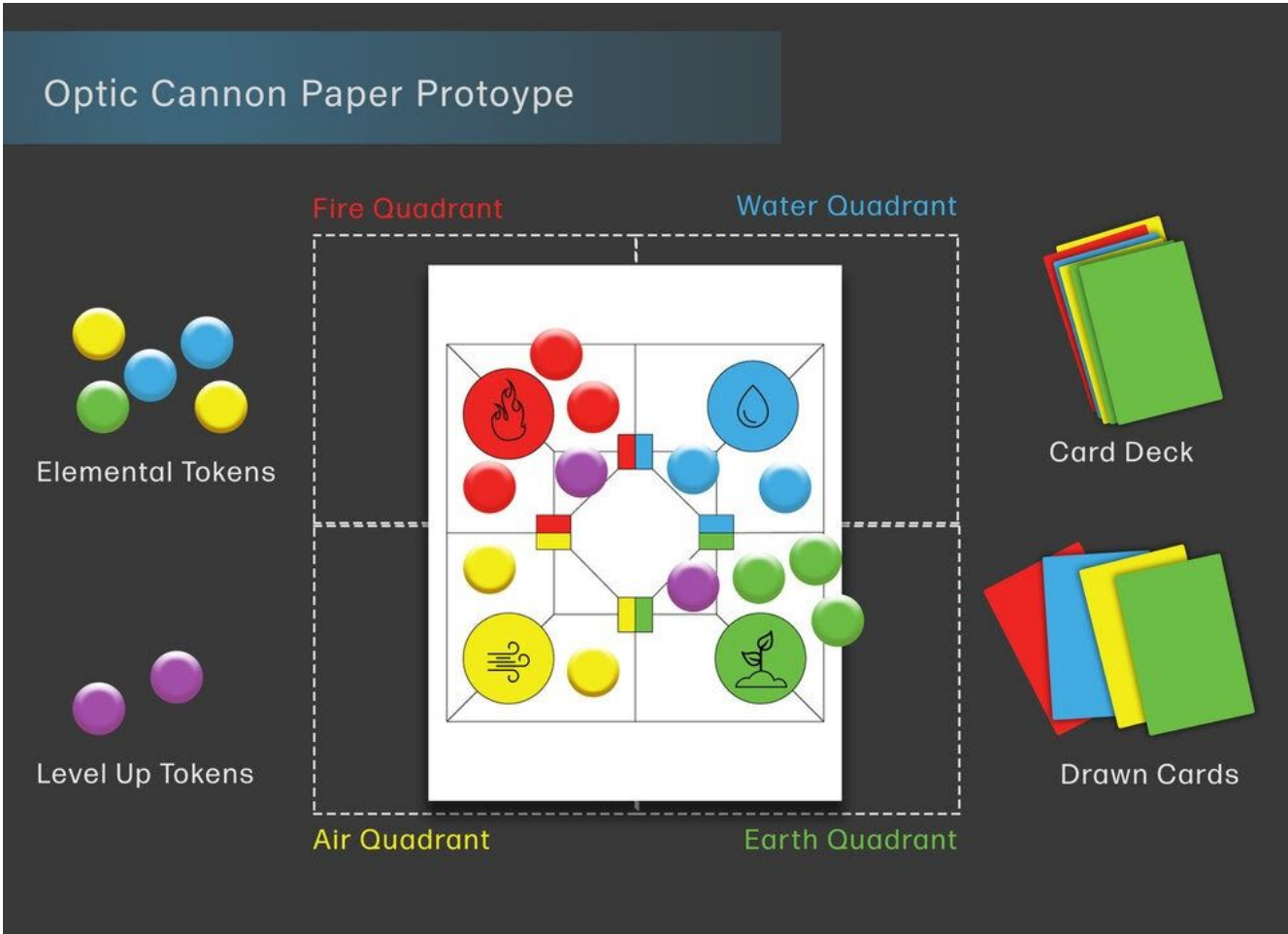
Prototyping:

Understanding how to playtest the ideas for this VR application was an iterative process between doing the actual vision therapy methods (mostly the Brock String), reading through the narrative, and then looking for possible connection points between both.

Performing the traditional therapy tasks provided insight into what the user experiences throughout their therapy and how to adapt the eye movement activities into engaging interactions. After many discussions with vision therapists, researchers, and developers, we began to formulate the core interaction directly tied to the Brock String fusing exercises.

Discussions with vision therapists and doctors revealed that the Brock String method is so commonly used by vision therapists. This feedback was helpful because in designing this experience, we had to accommodate two different types of users; patients and therapists.

Although VR is a 360 experience, we felt it was important to first playtest the activity itself. Knowing if this fusing exercise activity could be successfully gamified was a major priority. Once we understood what therapy activity to focus on, we began the prototyping process. The image below shows our paper prototype of the gamified therapy interactive:



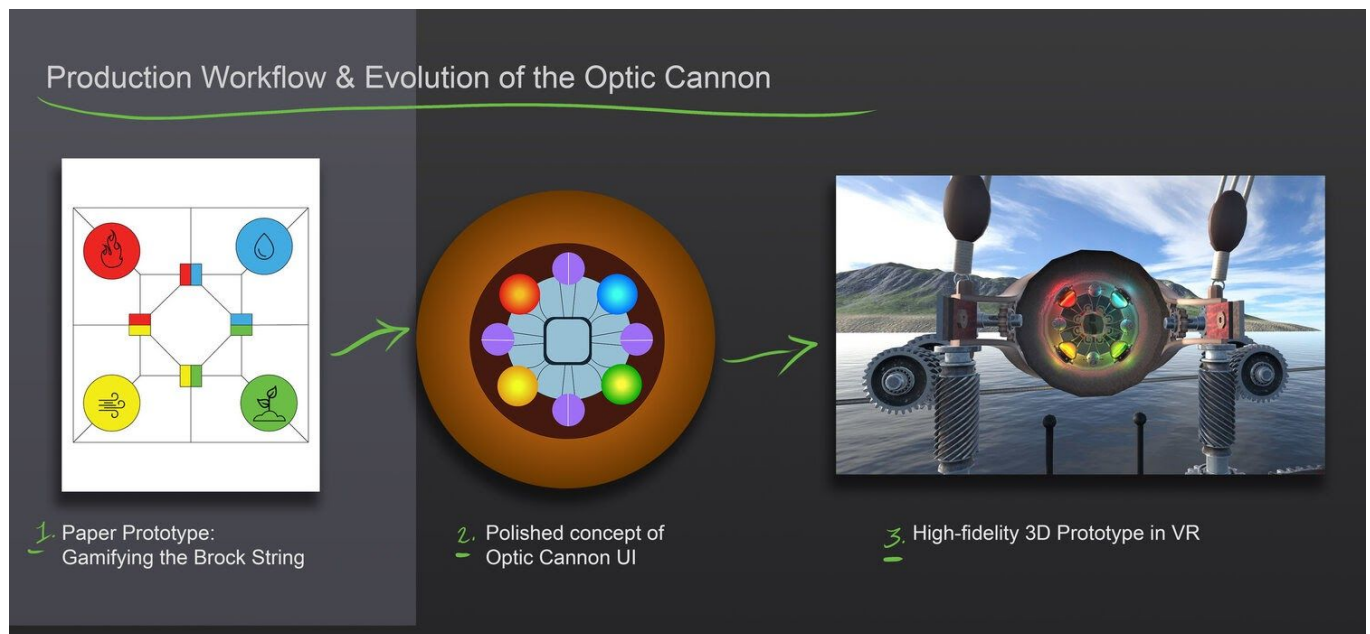
There are 4 colors that represent the 4 elemental powers which the user needs to capture and harvest:

Element = Color	Tokens per Element	Point System	Cards per Element	Spaces per Quadrant/Element	Purple/ Shared Zones
Fire = Red	4	3 Red = 1 Purple	4	3	Fire+Air/ Fire+Water
Air = Yellow	4	3 Yellow = 1 Purple	4	3	Air+Earth
Water = Blue	4	3 Blue = 1 Purple	4	3	Fire+Water
Earth = Green	4	3 Green = 1 Purple	4	3	Earth+Water
Combo Elements = Purple	3	4 Purple = Level Up	0	1	

The user will encounter these interaction points throughout the VR experience, each lasting around 20-60 seconds. During that time, the user will be in the Optic Cannon where he/she can view the magic elemental orbs. These are randomly generated and the user has 1 second to fuse on the orb of his/her choice.

This is represented within the paper prototype where we playtested this mechanic. The participant draws a card and then flips it over to see what color (elemental) it represents. Whatever color card the user draws represents what elemental he/she has “caught” and he/she earns a token to place within the associated area on the board.

Once the core mechanic of the interaction was defined, visual design of this Optic Cannon began. Below shows the design process of the Optic Cannon:





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 between sessions, 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 comic would be designed, following the conventions of the Loose Lens Accommodative Rock therapy. Both the in-office therapy (IOT) and the home-based therapy (HBT) would benefit from this adaptation.

This interactive draws directly from the Loose Lens Accommodative Rock vision therapy activity, where users have to read a list of words out loud to the vision therapist while looking through various lenses.

The idea for this HBT application was generated after collaborating with vision therapists and doctors on possible solutions for poor patient compliance. Vision scientists disclosed that patient compliance is lowest within the 8-17 age groups.



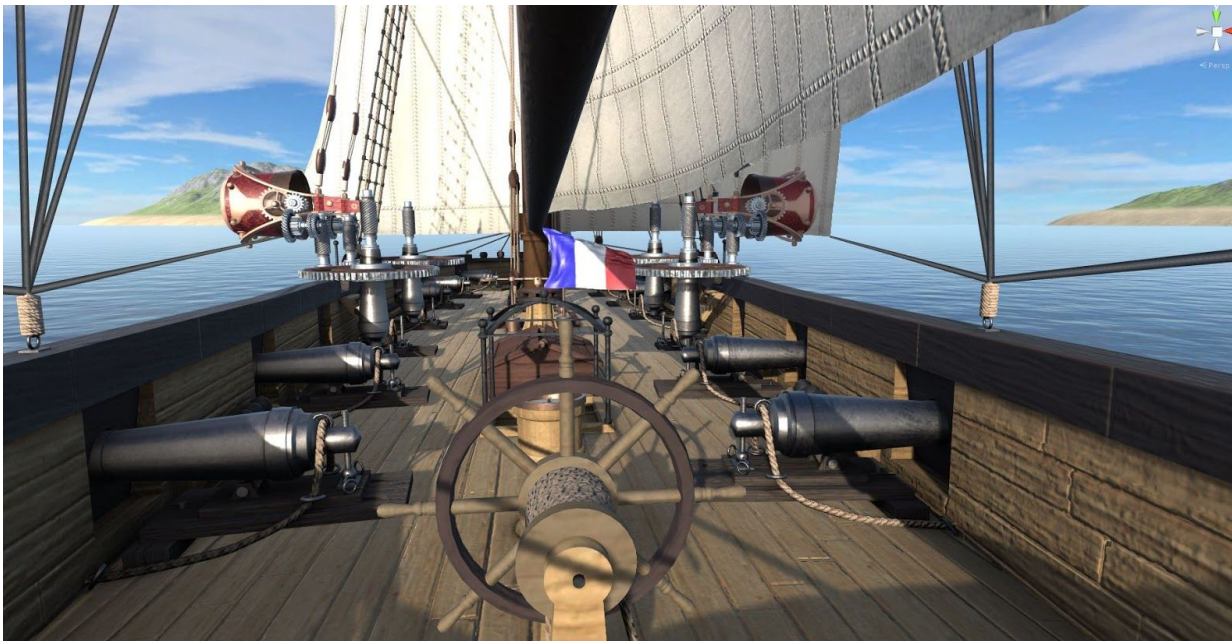
The story involves the user needing to decode a message within each issue. This is how the therapy method is being gamified within the comics.

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

Focus group interviews revealed that users prefer to see themselves (as their avatar), when playing video games. In VR, this will be a challenging feature to incorporate due to the first person nature of VR. This generated a brainstorming session with team members to find solutions. The following is a list of the solutions were the most viable:

- Walking past various reflective objects in each level. This can be a fun, surprise element in the game
- User can transport into their “Captain’s Quarters,” where there is a mirror/dressing room setup.
 - User can earn different weapons, gear, or costume elements throughout experience
- User comes across a mirror which can be kept in their inventory.
 - Could look into it when finding interesting costume elements (jewelry, eye patches, ect)



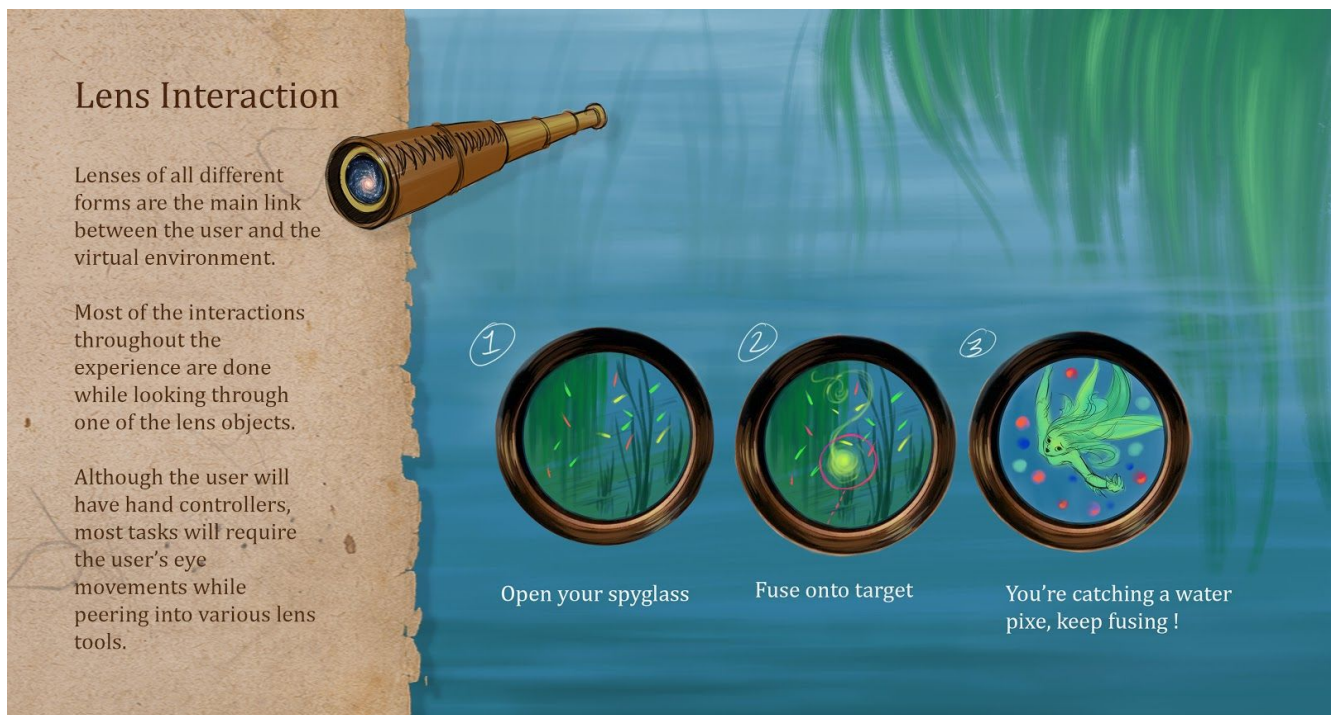
When the player calls upon these elementals, they rush out of the telescope and into the area of activity. When the activity is over, they rush back into the telescope habitat and wait until they are needed again. The user enjoys resting periods between the fusing exercises by playing with and feeding their elementals. This keeps the elementals happy, healthy, and willing to work for the crew.

Design Research

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. The following are vision tools used during the 17th-18th centuries and will inspire overall design of weapons and structures:

- 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

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.



Elemental Creatures & Abilities

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 earth), and will refuse to work together. Other elementals adore each other and are friends or distant relatives.

As the user progresses through the VR therapy game, the elementals available to capture become more powerful and more elaborate in design. This is meant to eliminate monotony and give the user incentives to continue performing the fusing exercises.

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.

