



Albacore Submarine VR Experience

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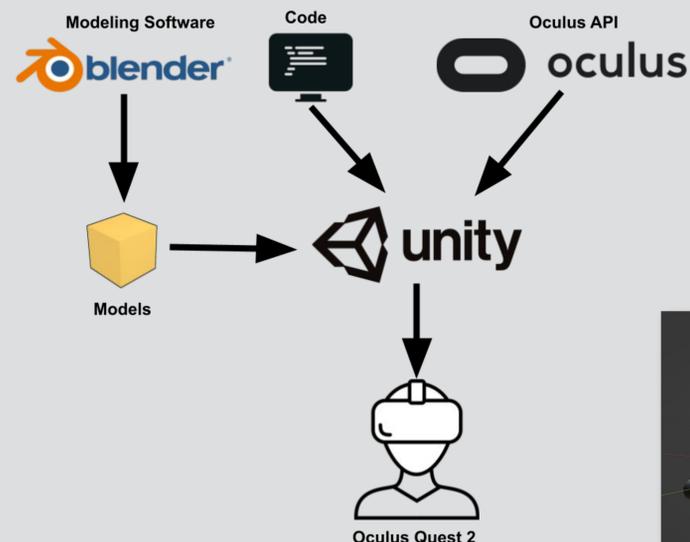
Albacore Park Executive Director: Patricia Violette

Introduction

The albacore submarine is a decommissioned military submarine that is now a museum exhibit. At the Albacore Park, guests are allowed to tour the interior of the submarine. However, this isn't accessible to those with disabilities or claustrophobia. The main goal of our project is to design a virtual reality experience for 90% of people who could not normally tour the submarine and allow them to experience a VR submarine instead.

Project Requirements

- Allow for users with disabilities who are unable to experience the submarine exhibit to experience the VR submarine exhibit.
- Provide an entertaining yet educational and accurate experience about what different controls and instruments do on a submarine.
- Have the virtual submarine respond to the user interacting with it (e.x. Being able to see through a periscope or levers causing the submarine to dive).



Workflow for designing the application

Implementation

- For hardware, we used the oculus quest 2 VR headset due to its standalone capabilities, affordability, and portability
- The software engine that drives the experience is the Unity 3D realtime engine due to its ease of use and compatibility with other tools we used. This software compiles all the code and models to be executed by the Quest 2 headset.
- Assets for the submarine were created in a 3D modeling software called Blender. Blender is a software that allows for designing models that can be imported into the project.
- For coding interactive objects in the environment, Unity handles a lot of the aspects itself such as gravity or physical collisions. However, for the actual interactive objects themselves, we can attach scripts written in C# to them that causes changes in the environment based on what the user does to them. Some examples of interactive objects in VR would be openable doors that lead to places, steering wheels, and buttons.
- Shown in the bottom left figure is the workflow integration for scripts, modeling, and coding for the application.
- In terms of physical movement, many interactives can be thought of as a button or a door in its simplest form. This means that a lot of code for the movability of objects reuse button or door movement code. For example, a steering wheel can be thought of as a very flat door that can be rotated around the middle.



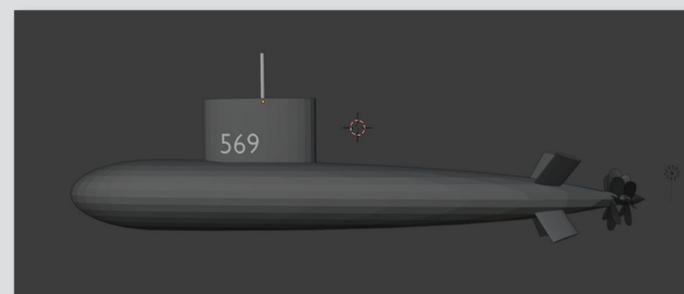
Image of Albacore Submarine

Conclusion

We currently have 5 rooms which are the control room, kitchen/mess hall, bunk room, central hub, and the exterior. Each of these rooms will also include interactives specific for those rooms. Our main goal of achieving 90% of individuals to be able to access the submarine was accomplished by making the rooms larger than the actual submarine and having the rooms lit up brighter with more color to everything. In the future we are hoping for this project to still be worked on by other groups. What we have now is just the start of the project and it will have more added to it as time goes on. Due to the modular nature of the rooms on the submarine, (each room is its own instance) it makes it easy to add, remove, or edit a room without affecting other rooms on the submarine.



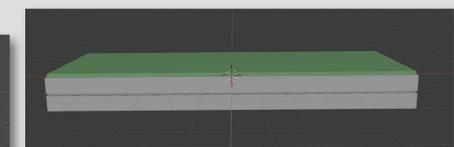
Model of periscope



Model of the Albacore Submarine



Control Room Scene in Unity



Model of a bunk bed



Model of life preserver