VR Planetarium - Public Facing Report: January 28, 2022

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1. Progress Report

Completed

Since the last progress report, we have accomplished a number of things. The team met with our advisor, Professor Giegel, and will be having weekly meetings with him moving forward in order to keep him updated on our progress as well as to get guidance in terms of project planning and VR Technology implementations. We also met with two students from Professor Mardini's 3D Modeling Project Collaboration class, Shriya and Kieran, who will be helping us to create assets for the various stars and planets. They have been added to our Discord in order to facilitate communication and we will be meeting weekly for updates as well.

In Progress

We are still setting up scheduled meetings with our other advisors, Professors Mardini and Nordhaus. Professor Mardini asked us to contact him after we are fully set up with his two students and Professor Nordhaus asked us to follow up with him after February 7th to arrange meetings moving forward. We also contacted the 3D Assets Lead from last year's iteration of the VR Planetarium and are in the process of getting the old assets in an usable format to be utilized for this year's iteration.

Shriya and Kieran are currently working on the first assets of one star and one constellation which will be perfected in order to serve as the "model" to set the

standards for the rest of the stars as well as constellations. They have a visual reference document as well as a technical requirement document provided by us which will need to be expanded to include the other planned stars/constellations.

We are also working to figure out the issue of text captions in VR. Text does not render well in VR, making it difficult for the user to read. The challenge also comes with how to balance the educational with fun in the VR Planetarium as a wall of blurry educational information will turn users off from wanting to learn more about the stars.

To Do

Going forward, there are some crucial things we need to accomplish.

- Narrow down the list of stars to be modeled
- Figure out the issue of text in VR
- Finalize meeting times (with advisors, Shriya and Kieran, and the team) for the rest of the semester
- Expand the Visual References document
- Begin work on the "Zoom in/out" function
- Begin work on the 3D diegetic menu
- Get last year assets

In addition, we are hoping to have a working model of the VR Planetarium to present to class for feedback on February 16th.

2. Project Proposal

Problem statement

In our world today, not everyone has access to clear stargazing conditions due to light pollution, cloud cover or inadequate viewing areas. Additionally, not many have access to educational museums teaching about space and the history of humankind's efforts to study the stars. The VR Planetarium project creates a virtual reality space designed to allow users to explore the skies

and learn about astronomy even without access to adequate stargazing conditions and traditional museums. The goal of the project is to create a Virtual Reality Planetarium, a publicly accessible educational tool that will promote user learning in a fun and interactive way as they navigate through the virtual environment.

Background and justification

Last year, DHSS Capstone saw a team of students create the VR Planetarium, a virtual reality model of a planetarium which allows the users to move from various settings within the model to get a clear and personal view of the night sky. That project can be found here: https://vrplanetarium.cad.rit.edu/
The team experienced challenges due to the limitations forced by the Covid-19 Pandemic, and were unable to fulfill all original goals. Despite these challenges, the 2020-2021 team were able to create a base for the VR Planetarium with various user locations and the ability to stargaze from a set location in the world. The goal for this year's project iteration of the VR Planetarium is to carry forth the work of the previous team while enhancing and adding more features to create an improved interactive educational experience.

Project Description

The VR Planetarium is a virtual reality model of a planetarium designed in Unreal Engine with 3D assets created with Blender modeling software. With the use of VR headsets and controllers, users navigate the virtual space and can choose from a variety of locations to explore such as within a planetarium or outside in the dedicated stargazing area. The target audience for this project is anyone interested in astronomy or learning about space. In the same way that museums are open for all ages, the VR Planetarium target demographic is all inclusive, open to minds curious to learn and explore using the clear and engaging VR educational materials. Individuals of all ages can enjoy the sounds and visuals of the virtual 3D space with the option to learn more through reading the supplementary text or enabling a voice over of the same text.

3. Timeline

Visualization

Fall semester

The bulk of the fall semester was focused on project planning and preparation for the spring semester. We contacted three advisors throughout the semester; Ihab Mardini for 3D Design, Jason Nordhaus for Astronomy, and Joe Giegal for VR Technology. In addition, we collaborated with a music student who composed the background music as part of their final project. We also prepared for a possible future collaboration with Professor Mardini 3D Collaboration Class.

Spring semester

Week 1: We met with Mardini's class to pitch the project to potential collaborators.
Week 2:
-PFR #1 Due
-Meeting times with advisors

Mardini - twice a month meetings
Nordhaus - weekly meetings
Giegel - weekly meetings

Week 3:
-work on research doc

Entering February:
-meeting with advisors
-first assets from Shriya and Kieran
-PFR #2 Due

Week 4:
-Expand Research and Visual References Doc
-work on zoom in/out function with S+K assets

-work on the issue of text in VR

Week 5:

-continue expanding Research and Visual References Doc

-continue work on zoom in/out function

-figure out the text issue in VR in order to begin the actual writing process

4. Memorandums of Understanding

Joe Geigel - Virtual Reality, User Function, Unreal Engine

Ihab Mardini - 3D assets and textures

Jason Nordhaus - Astronomy and Educator Perspective