Lab Project Specifications

Objectives

The project aims to develop an interactive 3D model viewer application that allows users to interact with 3D models using keyboard and mouse inputs. The application will feature realistic lighting, textures, and animations to enhance the user experience. A comprehensive user manual will be provided to guide users on how to navigate and use the application effectively.

Key Features

The following features should be implemented in your project:

1. **3D Models**
   - High-quality 3D models of various objects, environments, or products.
   - Models should be optimized for real-time rendering and interaction.
2. **User Interaction**
   - Keyboard and mouse inputs for navigating and interacting with 3D models.
   - Intuitive controls for zooming, rotating, and selecting objects in the 3D space.
3. **Lighting**
   - Realistic lighting effects to enhance the visual appeal of the 3D models.
   - Dynamic lighting to simulate different lighting conditions (e.g., day/night, indoor/outdoor).
4. **Texture**
   - High-resolution textures to add detail and realism to the 3D models.
   - Texture mapping to ensure textures are correctly applied to the 3D geometry.
5. **Animation**
   - Animated sequences to showcase dynamic elements of the 3D models (e.g., moving parts, effects).
   - Smooth transitions between different animation states.
6. **User Manual**
   - A detailed user manual explaining how to use the application.
   - Step-by-step instructions with screenshots or illustrations for clarity.

Project Proposal

Create a group of **3-4 members** and draft a proposal. Make sure to include the specifics on how your group would **implement key features 1 to 5**.

You may explore the following WebGL projects to help you with your project ideation and to serve as an inspiration:

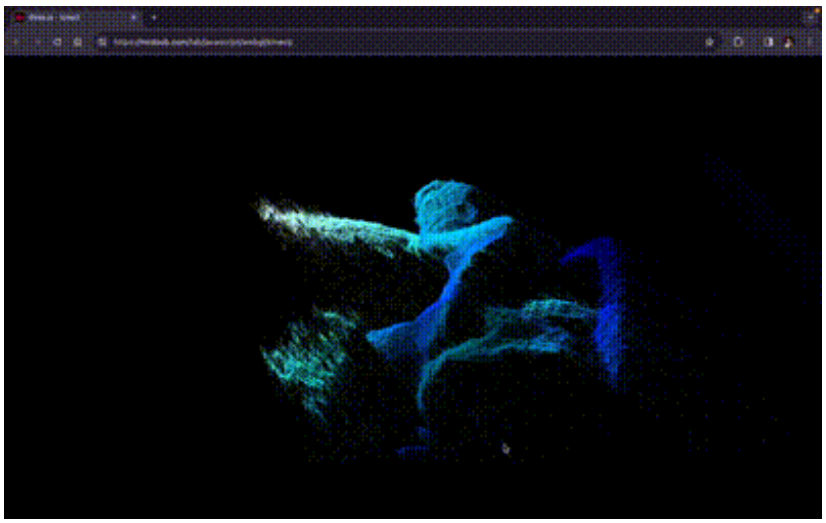

Figure 1: Experiment visualizing Kinect data with WebGL by Mr.doob (2011). This project uses the cursor to move the figure. Experience the interactive graphics here.

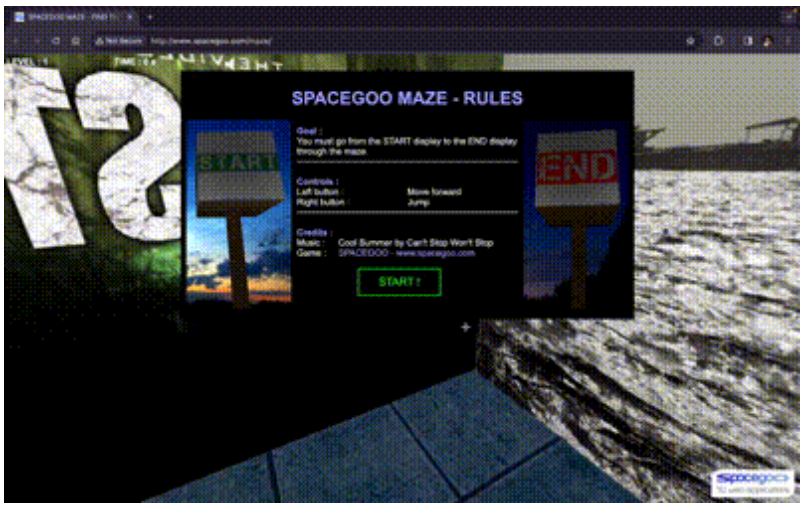

Figure 2: A 3D maze game made with Webgl by Xavier Bourry (2011). The left and right keyboard arrows are used to navigate the maze. Experience the interactive graphics here.

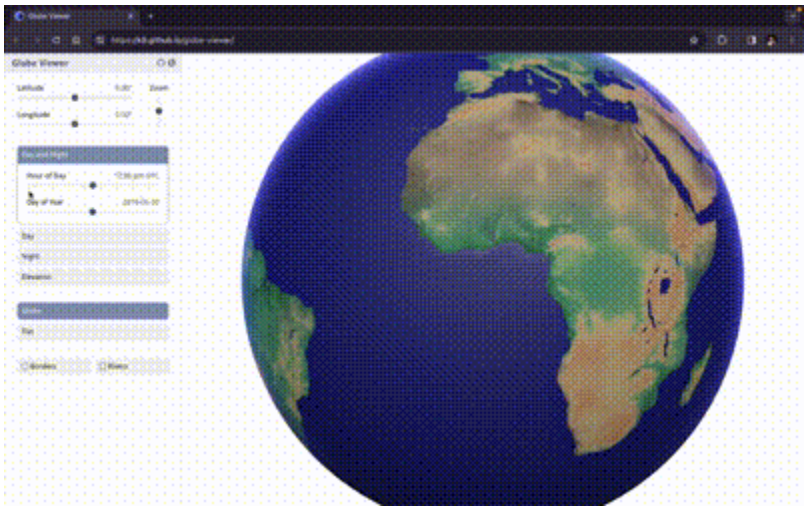

Figure 3: Visualize the globe in different ways using WebGL by Kevin James (2016). Different sliders and parameters are used to explore the globe. Experience the interactive graphics here.

Deadline of Project Proposal

The deadline of submission for your project proposal will be on the week of **April 22-26, before your lab schedule**. Feedback on your proposals will be given a week after the deadline.

Project Presentation

The deadline of submission for your working code and user manual will be on **June 2, 2024**. The code submitted on or before this deadline will be the final project version that will be presented during the **finals week (June 3-7)**. A sign-up sheet will be uploaded prior to the project deadline. Each group shall be given 15-20 minutes to set up and present their work.

If you have any questions or concerns, please feel free to consult your laboratory instructor.