Virtual Birthday Party Experience

Virtual Reality based Project

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***Abstract*—This document gives a broad overview of implementation of our Virtual Birthday Party experience which is a project under Computer Graphics**

INTRODUCTION

The underlying goal was to produce a birthday experience using VR for entertainment purposes. **Virtual reality** (**VR**) is a simulated experience that can be similar to or completely different from the real world. Applications of virtual reality include entertainment (particularly video games), education (such as medical or military training) and business (such as virtual meetings). A person using virtual reality equipment is able to look around the artificial world, move around in it, and interact with virtual features or items.

Aframe

Aframe is a powerful three.js framework , providing a declarative , composable , reusable entity-component component structure.js.

HTML is just the tip of the iceberg , developers have access to Javascript,DOM APIs, WebVR and WebGL. Aframe is optimized for the ground up for WebVR. The decision by us to choose Aframe to power our project stems from the angle to make a life like exploration and entertainment secure and performant.
Aframe also provides facility for the web client as :

- Users can work on scenes using any text editor,given that Aframe is not a binary format.
- Support for physics like relative motion and position can be baked in.
- Code interactions using a declarative language.
- It incorporates an entity component based system which allows for easy extensibility as it has numerous pre-defined basic building blocks.
  It's easy to use install feature , vast number of already available projects and very well written documentation made it our choice.
- It is optimized from the ground up for WebVR.
- A handy built-in visual 3D inspector.

Development

Our development process was comprised of

- Creating an outline of what will the house compromise - number of rooms, items to be placed inside the room
- Distribution of people traveling between different rooms

Hardware configuration

- Minimum 8GB RAM
- Quad core CPU
- Dedicated GPU for smooth experience
- SSD - 256GB
- VR / handheld device such as Google cardboard

Software Configuration

- Operating system Windows 10/11 or Linux based
- Web server such as Google chrome or Mozilla Firefox (later one preferred)
- Code editor (preferably VS Code)
- Extension like Ritwick Dey's Live server

Methodology

- Using Visual Studio as code editor and testing our website locally using Ritwick Dey's Live server extension
- Using Aframe to build our virtual reality
- Using Xampp as local server to host our project

Architecture of House

- The Outside of the house has trees and cars which are taken from the internet which we have downloaded according to our requirement and added to the assets subfolder.
- Inside of house we have two rooms -
    - Theater room
    - Bar room or living room

- Passage to travel between different rooms and come in and out of the house.
- Adding different objects in the house like sofa and other furniture , home theater to enjoy and watch video as per video we play on it which resides in the assets subfolder itself.
- Adding different light effects to get a party feel
- Numerous gltf models are used in project which give a more real feel to objects as developing objects from primitive tools is not a viable choice . Use of these gltf models helps in minimizing both the size of 3D assets, and the runtime processing needed to unpack and use those assets .
- We have used 3d models from sketchfab in .gltf file format, as well as .mtl and .obj files from blender. We placed these entities in their position and changed their scales to match the rooms
- Sound effects are also added through use of inbuilt features of Aframe like Aframe.registerComponent which helps us making custom objects which is used throughout with help HTML attributes like id.
- One of the features of Aframe we used extensively was relative positioning of objects with respect to other objects .

FUTURE IMPROVEMENTS

- Making an interface to add or remove participants from a menu rather than from editing the code
- Expanding number of rooms and adding new objects for enjoyment
- Making it more interactive
- Saving previous changes made in VR using a NoSQL type database.

Results

We were able to host a Birthday Party of a friend, sitting at 5 different locations virtually. It was a very smooth experience.

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REFERENCES

- https://aframe.io/
- https://template-selector.ieee.org/
- https://www.blender.org/
- https://creazilla.com/sections/3-3d-models/tags/649-gltf
- https://sketchlib.com/
- https://www.textures.com/