3DMODEL FINAL PROJECT DOCUMENTATION

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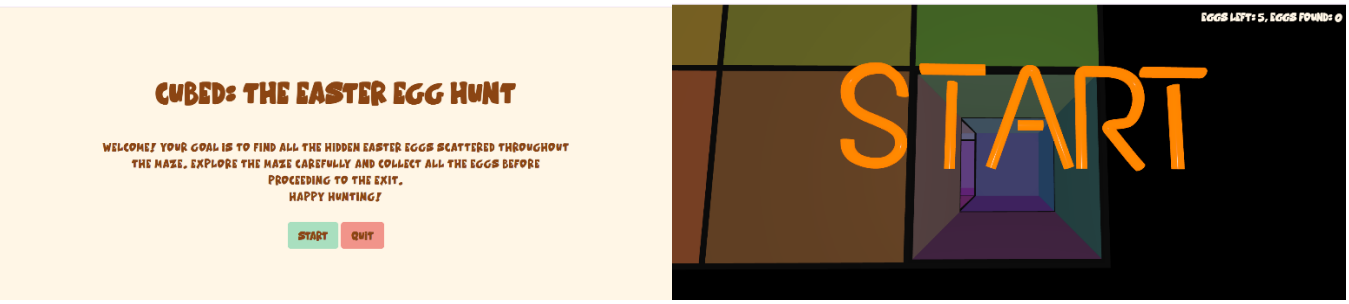

Cubed: The Easter Egg Hunt

I. PROJECT DESCRIPTION

Oh no! Easter Bunny's basket slipped and all the eggs it contained were scattered throughout the cube. As the Easter Bunny's helper, you are tasked to collect the eggs that were left in the cube. After which, you must also find your way out of this cube full of walls.

Cubed: The Easter Egg Hunt is a game wherein the player will have two goals: to collect eggs, and to reach the exit as fast as possible. It is a first-person point of view and the user is free to move. This project aims to train navigation where the player must find the exit in a labyrinth with the shape of a cube. In addition, the player must also explore around the cube, collecting eggs before he is able to escape the cube.

The project draws inspiration from the combination of labyrinths, where players must escape a maze and egg hunts, where the user must find Easter Eggs scattered around a world. It not only can stand as a game itself, but it can also serve as foundations for future games. Stories can be made to make the game more entertaining. Also, this can also be part of a larger games, such as being a single room in an escape room game.

II. HOW TO RUN YOUR PROGRAM

The program should be served as simply running the HTML would violate CORS policy. One way to run the program is to type in "npx vite" in the command line. Make sure to follow the Threejs installation first (this includes running "npm install --save three" and "npm install --save-dev vite"). This will host a local server and the program can be accessed through http://127.0.0.1:5173/ in the browser.

III. CONCEPTS YOU APPLIED

Model

Several models are created for the project. First is the wall model which is used in building the cube itself. These walls correspond to each building block or cell in the cube maze that is built in the program.

The second model is the egg which are the objects that the player must collect throughout the game.

Finally, signs were also modelled to guide the players where the start and finish are located.

Lighting

Lighting is a concept required for the project so that the maze is illuminated and the user can navigate through it. Throughout the project, an ambient light is added so that the maze will be visible for the user. Moreover, a PointLight is also added that is placed in the same position as the camera for a perception of depth. Closer parts will be brighter due to this PointLight.

Camera and Movement

The concept of the camera and user view is also used in building the project. The user will be on a perspective camera as it is a first-person game. Therefore it must simulate a user's view. Camera movement is also applied in the project. Specifically, this project allows 6 degrees of freedom for the user. The user can move through the 3d space using the WASD keys. Moreover, the user can rotate the camera using mouse movement.

Other Concepts

Building the maze takes advantage of the Wilson's algorithm which is a specific maze generation algorithm. This is done in the maze.js file which outputs the maze data. Building the maze model in the viewport takes advantage of transformation concepts such as rotations and translations to make the walls side by side and on the correct orientation.

Collision detection uses camera position and the positions of the walls. Collecting the eggs also uses collision detection, finding out the distance between the eggs and the user. Once collected, eggs should not be seen in the scene. This is done by removing the object from its parent which is the scene object.

IV. RESOURCES THAT YOU BORROWED FROM THE PUBLIC DOMAIN

Some algorithms such as maze generation algorithm were obtained from Chris Raff's 3D-maze (2020).
Image textures used for the egg models were retrieved from:

- *Bulbasaur texture was retrieved from https://wallpapersafari.com/w/ZKirjT*
- *Polka dot background was retrieved from https://id.pinterest.com/pin/413416440807737609/*
- *Other textures were retrieved from https://www.canva.com/*

V. REFERENCE

Algorithms and Code Snippets:
Raff, C. (2020). 3D-maze. Github. Retrieved from https://github.com/chrisraff/3d-maze

Image Textures:
Pokemon Bulbasaur Wallpaper (n.d.) Retrieve from https://wallpapersafari.com/w/ZKirjT
Malipa Studio. (n.d.). Pastel Small Purple Gingham, Checker [Image]. Canva
Designs by Chelsea. (n.d.). Valentine Heart Pattern [Image]. Canva
Kun, E. (n.d.). Texture Floor Wall Pattern Line Color Tile Circle Art [Image]. Canva
Wakeham, B. (n.d.). Pastel Multicoloured Sprinkle Pattern [Image]. Canva
Duffy, C. (n.d.). Painted Pastel Background Textures [Image]. Canva
borzywoj. (n.d.). Pastel Colors Strips [Image]. Canva
Pinterest. (n.d.). Polka dots background [Image]. Pinterest. Retrieved from https://id.pinterest.com/pin/413416440807737609/