2D/3D Animation Art

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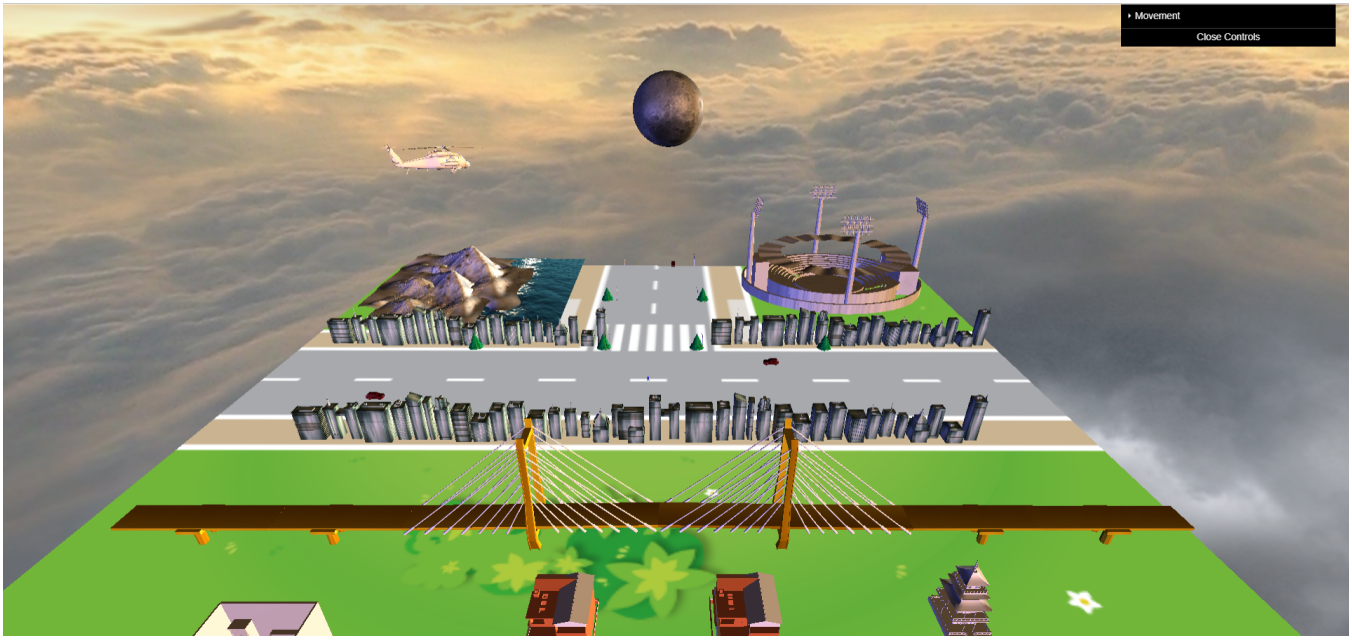

Figure 1: Snapshot of Project

ABSTRACT

Our project is a 3D Animation Model of a city. To view the 3D Effects, we need to be on the python server. The Project has been implemented using THREE JS. Various objects have been loaded using OBJ Loaders. The cars and helicopter move around once you click on AnimateCity in the GUI. The Robot also moves around once you click on walk. The cars have been modified to move around in the designated road area.

KEYWORDS

WebGL, THREEJS, Animation

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1 INTRODUCTION

The project helped us learn how THREEJS animation is built. As a contribution to the project I have added the following features and their animations: 1. Skybox 2. Cars 3. Helicopter 4. Mountains 5. Buildings/Houses 6. Stadium 7. Bridge

2 RELATED WORK

https://threejsfundamentals.org/threejs/lessons/threejs-load-gltf.html

3 METHOD

A sky box was created to give a 3d effect of the sky.

Further, a plane was created as the floor of the city. An image which has roads pre-drawn was selected as the floor to depict the roads of the city.

The Project has various objects loaded in it. Also, some of the objects have been created using Helper.js. Buildings, Trees, Mountains, helicopter, car, water are some of the objects loaded. Robots and street lights have been created using Helper.js All objects have been loaded with various textures.

A video effect was added to the water to show moving waves. This effect is only visible when you turn on the python server.

Animation has been added to the helicopter, car and robots. They all move within the city roads.

3.1 Implementation

Sky Box:

```
  // create skybox
  let materialArray = [];
  let tl = new THREE.TextureLoader();
  let tx_ft = tl.load("stormydays_ft.png");
  let tx_bk = tl.load("stormydays_bk.png");
  let tx_up = tl.load("stormydays_up.png");
  let tx_dn = tl.load("stormydays_up.png");
  let tx_rt = tl.load("stormydays_rt.png");
  let tx_lf = tl.load("stormydays_lf.png");
  materialArray.push(new THREE.MeshBasicMaterial
  ({ map: tx_ft }));
  materialArray.push(new THREE.MeshBasicMaterial
  ({ map: tx_bk }));
  materialArray.push(new THREE.MeshBasicMaterial
  ({ map: tx_up }));
  materialArray.push(new THREE.MeshBasicMaterial
  ({ map: tx_dn }));
  materialArray.push(new THREE.MeshBasicMaterial
  ({ map: tx_rt }));
  materialArray.push(new THREE.MeshBasicMaterial
  ({ map: tx_lf }));
for (var i = 0; i < 6; i++)
    materialArray[i].side = THREE.BackSide;
  let skyboxGeo = new THREE.BoxGeometry
  ( 100000000, 100000000, 100000000 );
  skybox = new THREE.Mesh(skyboxGeo, materialArray);
  scene.add(skybox);
```

Animation:

Below is a snapshot of how the car is moving:

```
          renderer.render(scene, camera);
          if(carmodel.position.z < -500 && count > 1)
          {
           carmodel.position.z = c + 20;
           }
         else
         {
           count = 0;
           carmodel.rotation.set(0,-Math.PI/2,0);
      carmodel.position.x = carmodel.position.x - 10;
           if (carmodel.position.x < -4000)
           {
               carmodel.rotation.set(0,-Math.PI/2,0);
            carmodel.position.set = (400,-100,-5000);

             carmodel.position.x = 0;
             count = 2;
           }
      }
```

3.2 Milestones

How did you structure the development?

3.2.1 Milestone 1. Create a skybox and a choose a floor to suit the graphic needs of the project.

3.2.2 Milestone 2. Finding suitable obj files. Loading and placing these obj files on the floor

3.2.3 Milestone 3. Adding the animation to the objects.

3.3 Challenges

Describe the challenges you faced.

- Challenge 1: Adding animation to the cars was a challenging task. The cars had to be made moving only in the designated road area. Further, one of the cars required turning to its right.
- Challenge 2: Adding various materials to the objects was also a challenging task.
- Challenge 3: Creating various Street Lights through Helper Js.

4 RESULTS

Finally we have created an 3D animated city with various structures and vehicles.

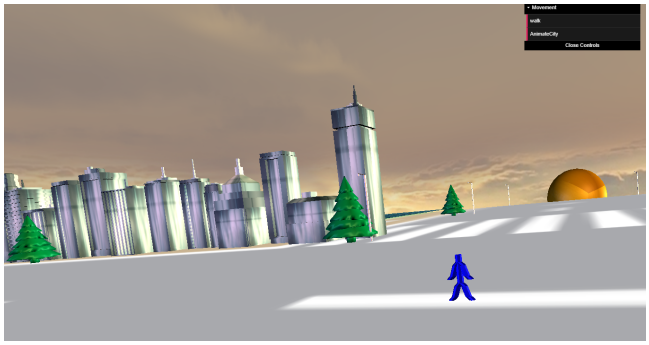

Figure 2: Another glimpse of the project.

5 CONCLUSIONS

This project helped us learn various THREEJS elements and how to combine these together to create an animated experience.

REFERENCES