Lesson 2

João Fonseca -103154
Diogo Paiva - 103183
Information Visualization, 2023 (MSc Computer Science and Engineering, University of Aveiro)

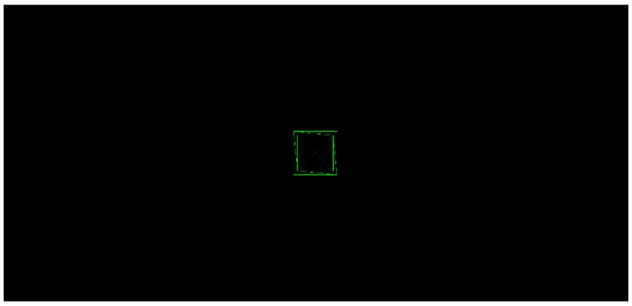
Introduction

This report addresses the exercises done in Lesson 2 of Three.js.

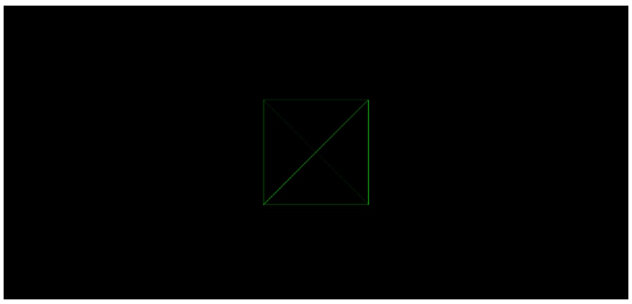
Exercise 1

We were asked to change the first example from the first class to visualize the cube in wireframe and use the Orthographic Camera.

Result with perspective camera:



Result with Orthographic Camera:



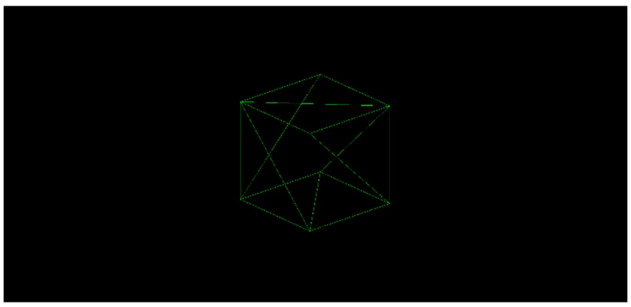
```
var aspectRatio = window.innerWidth /
window.innerHeight;
var top = 3 / aspectRatio;
var bottom = -3 / aspectRatio;
var camera = new
THREE.OrthographicCamera( -3, 3, top,
bottom, 1, 1000 );
```

The result is what we expected.

Exercise 2

Add OrbitControls to the previous example.

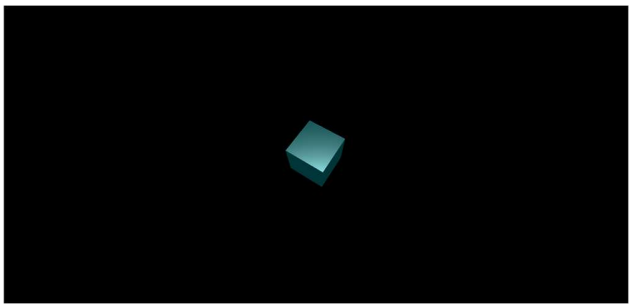
```
const controls = new OrbitControls(camera,
renderer.domElement);
controls.update();
```



We also tried other controls as shown in the code.

Exercise 3

Add lights to the scene.



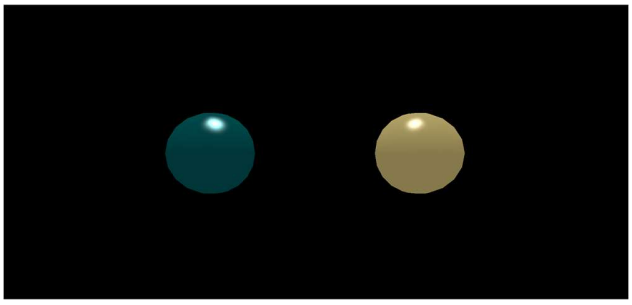
```
const light = new
THREE.DirectionalLight(0xffffff, 1.0);
light.position.set(0, 5, 0);
scene.add(light);

//AmbientLight
const alight = new
THREE.AmbientLight(0xffffff);
scene.add(alight);
```

Exercise 4

widthSegments — Number of horizontal segments

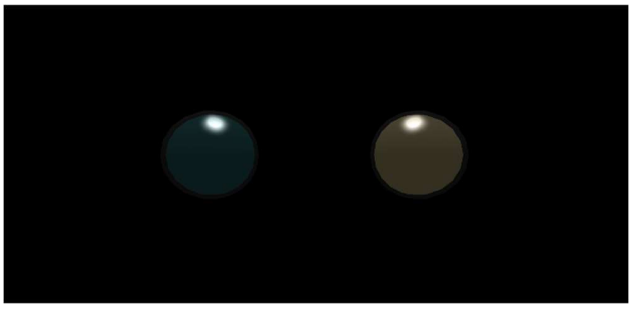
heightSegments — Number of vertical segments

Modify the flatShading option of one of the materials by toggling between true and false and observe the result – Instead of using Phong shading will use flatshading.



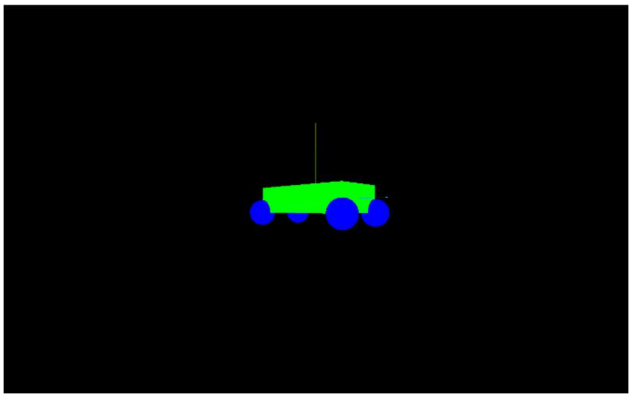
Exercise 5

Add spheres with a slightly larger size around original spheres and use material provided by the professor.

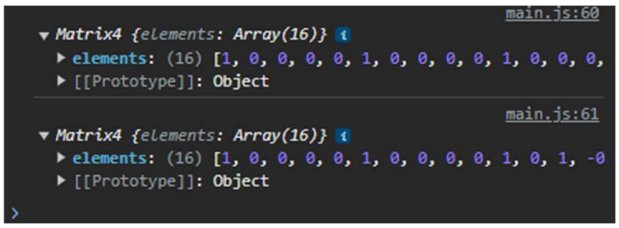


Exercise 6

Create a new scene consisting of four spheres (radius 0.5) centered on its lower. Add multiple meshes into a single THREE.Object3D().

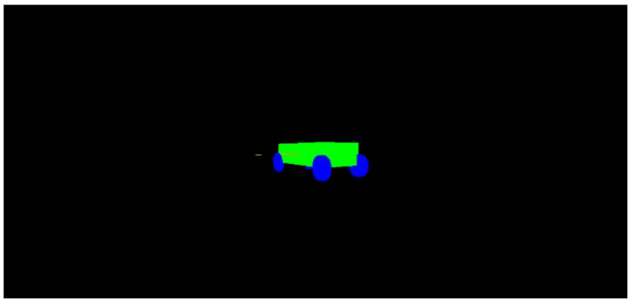


View the transformation matrices of the parallelepiped and of one of the spheres on the console, accessing the matrix (matrix) with the transformations of the objects.



Exercise 7

Replace the spheres with cylinders with radius 0.5 and height 0.2 and move the “car”.



```
object.position.z += 0.01;
    if (object.position.z >= 6) {
        object.position.z = -6;
    }
```