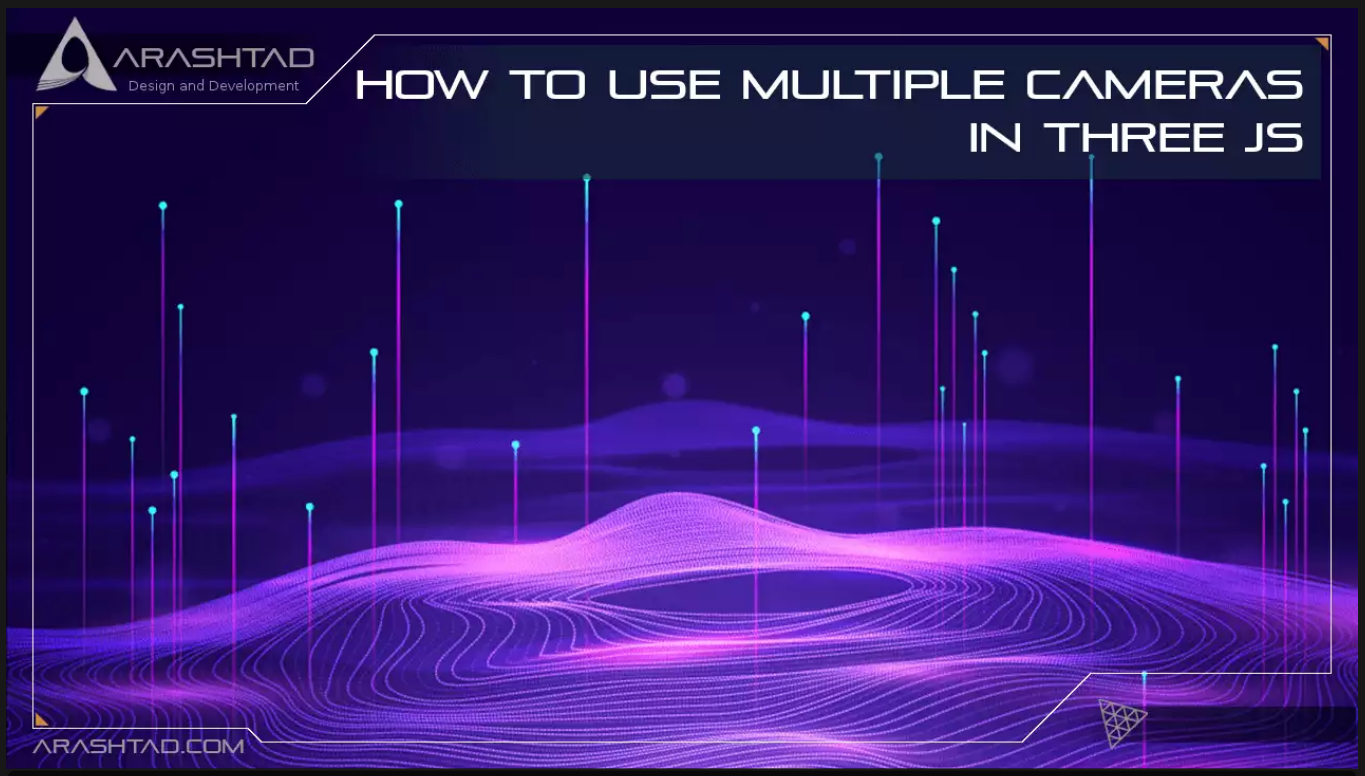
# How to Use Multiple Cameras in Three JS

No comments




***In this tutorial, we will cover one of the less available projects in Three.js on the internet. And that is creating multi-camera scenes. Up to now, nearly all the projects in Three.js that we have seen have the object and scene using only one camera and the viewer was only able to see a certain animation from one view port. But, now using the method we will use in this article, we will be able to cover two or more aspects of the scene. This is wonderful! Because there are some games or animations that need more than view of the scene, and if we can see how to create multiple cameras, we can bring this wonderful feature in our projects and make it more fascinating. The scene we are going to see, is very simple. We will animate a rotating cube and our main camera will cover the moving sides of the cube and the other one will cover the top view of the rotating cube. The top camera will be shown on the top right corner of the browser page, while the main camera will cover the whole page.***

## Setting up the project:

We will get started with the main elements of a Three js scene, including the camera, the renderer, the scene, and the object. Before doing that, we use the Vite plugin to easily create all the folders and files you need to run the Three.js code. First off, create a folder in the directory of your projects by using the following commands: `mkdir MultiCamera`
`cd MultiCamera` Then, inside of the your project folder, create the necessary files and folders by simply running the Vite plugin command: `npm create vite@latest` Then enter the name of the project. You can write the name of your project as the name. And also the package (the name is arbitrary, and you can choose anything you want). Then select vanilla as the framework and variant. After that, enter the following commands in the terminal. Notice that here MultiCamera is the project folder's name, and thus, we have changed the directory to MultiCamera. The name depends on the name you enter in the Vite plugin : `cd MultiCamera`
`npm install` Afterward, you can enter the JavaScript code you want to write in the main.js file. So, we will enter the base or template code for running every project with an animating object, such as a sphere. Also, do not forget to install the Three.js package library every time you create a project: `npm install three`

## The code:

Now, enter the following script in the main.js file:

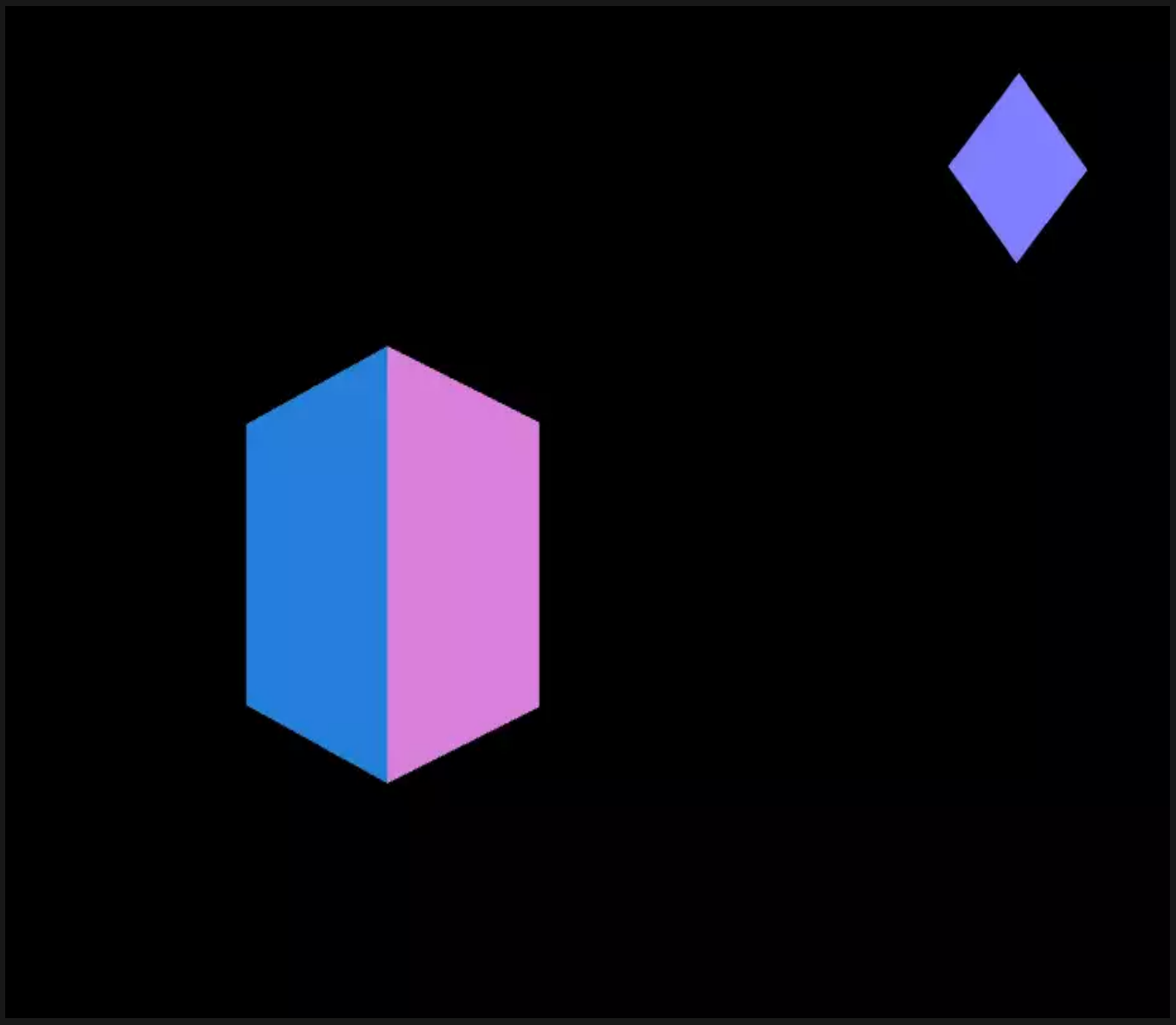
```
import * as THREE from 'three';
import { Mesh } from 'three';
const scene = new THREE.Scene();
const renderer = new THREE.WebGLRenderer({
     antialias : true
});
//main camera
let camera = new THREE.PerspectiveCamera(
     90,
     window.innerWidth / window.innerHeight,
     0.01,
     500
);
camera.position.set = (0, 0, 0);
camera.lookAt(0, 0, 0);
//Top camera
let Topcamera = new THREE.PerspectiveCamera(
     70,
     (window.innerWidth / 4)/(window.innerHeight / 4),
     0.01,
     500
);
Topcamera.position.set = (0, 0, 0);
Topcamera.lookAt(0, 0, 0);
camera.add(Topcamera);
scene.add(camera);
```

```
renderer.setSize(innerWidth, innerHeight);
document.body.appendChild(renderer.domElement);
//creating a cube
const geometry = new THREE.BoxGeometry(5,5,5)
const material = new THREE.MeshNormalMaterial()
const cube = new THREE.Mesh(geometry, material)
scene.add(cube)
//Light source
const width = 20;
const height = 20;
const intensity = 2.5;
const rectLight = new THREE.RectAreaLight(0xffffff, intensity,
width, height);
rectLight.position.set( 5, 5, 5 );
rectLight.lookAt( 0.5, 0.5, 0.5 );
scene.add( rectLight );
var insetWidth;
var insetHeight;
function resize (){
     camera.aspect = window.innerWidth / window.innerHeight;
     camera.updateProjectionMatrix();
     renderer.setSize(window.innerWidth, window.innerHeight);
     insetWidth = window.innerWidth / 4;
     insetHeight = window.innerHeight / 4;
     Topcamera.aspect = insetWidth / insetHeight;
     Topcamera.updateProjectionMatrix();
}
window.addEventListener("resize", resize);
function animate(){
     requestAnimationFrame(animate);
     cube.rotation.y += 0.02;

     camera.position.x = cube.position.x;
     camera.position.z = cube.position.z + 10;
     Topcamera.position.x = cube.position.x;
     Topcamera.position.y = cube.position.y + 10;
     Topcamera.position.z = cube.position.z - 10;
     Topcamera.rotation.x = -Math.PI/2;
     renderer.setViewport(0, 0, window.innerWidth,
     window.innerHeight);
     renderer.render(scene, camera);
     renderer.clearDepth();
     renderer.setScissorTest(true);
     renderer.setScissor(
          window.innerWidth - insetWidth -16,
          window.innerHeight - insetHeight - 16,
          insetWidth,
          insetHeight
     );
```

```
        renderer.setViewport(
            window.innerWidth - insetWidth -16,
            window.innerHeight - insetHeight - 16,
            insetWidth,
            insetHeight
        );
        renderer.render(scene, Topcamera);
        renderer.setScissorTest(false);
    }
    resize();
    animate();
```

Now if we save the code, and enter the following command in the terminal: `npm run dev` We should see the following result:



As you can see in the above photo, the main camera has captured the main view of the rotating cube, while the top camera has covered the top view of it.

## What we did in the code:

The first thing we did at the beginning was to import the necessary libraries. Then, we defined the scene, the light source, the camera, and the renderer. Afterward, we defined another camera named the Top camera with nearly the same properties. The only difference was in the position of the cameras which you can set according to your scene. Notice that we will later change the position and the rotation of the cameras in the animation function. Next, we declared the geometry, material, and finally the object using the first two parameters. Now we need two functions, first one is called resize and it is for resizing the window according to the browser size and the second one is the animation function. Inside the animation function, we write the necessary scripts for rendering the scene using the two cameras. First of all, the cube should rotate, so we wrote the rotation code for that. Then we need to determine the position of

the cameras. Notice that the top camera should rotate by 90 degrees as well. Next, we should set the viewport and the scissor of the renderer. Finally, we need to add the scene and the two cameras to the renderer.

## Conclusion

In this article, we managed to render a scene using two cameras in different positions with different rotations. Although this project was so simple, it has the necessary scripts and building blocks for the developers to extend and develop it. The use cases of having multiple cameras in the renderer are in the computer games, races, sport matches, animations and so on. The concept of using multiple cameras for the same scene and from different aspects provides excitement and engages the viewer or the player to whatever you have created, whether it is an event, a sports match, or a computer game. Hope you have enjoyed this tutorial. If there is anything ambiguous about the codes we have written, do not worry because we have created a tutorial video based on this article, and have published it in our channel called Arashtad.

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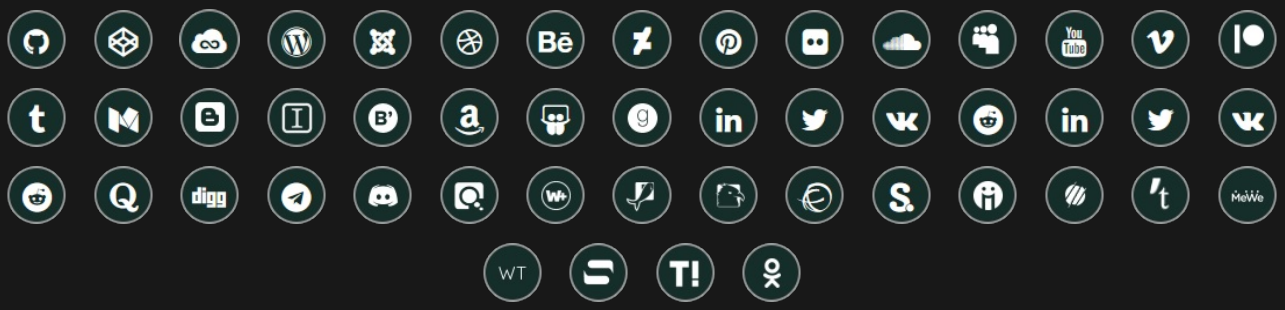

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