Assignment 5

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1 Introduction

In this assignment we were expected to first, add texture to a cube in part one and we were asked to create a scene that has 625 cubes with textures with movable camera and spot lighting in part two.

2 Experiment

2.1 Part 1

In the part 1 of the assignment, we were asked to add texture to cube, to do that i used developers mozilla' [2] website to achieve what was wanted. For the functions, we were asked to add movements to the light in the scene. To do that, i added buttons to the html part of the code and from there app got values from user interaction and changed the position of the light in the scene.

2.2 Part 2

In the assignment's part 2, we were asked to add 625 cubes with textures and a surface with another texture. After that we were asked to add a movable camera and attach a light to the camera.

For the first part i modified the colorCube function with x and y values and with those i created every cube into an 2d array which held the faces of the cube and within the same function i added normals to another 2d array as well. After that, to keep only one cube in the one element of array i merged 6 elements of it, same for the normal array. For surface just like drawing a face of cube i added its own coordinates and calculated its normals and sent those values to another array to draw it. I added textures to all the cubes and the surface using loadTexture function, just like the part 1 of the assignment. To create a camera i made lookAt, and perspective functions which sent matrices

to the vertex shader. To move the camera i took keyboard interaction from the keyboard and mouse using pointerLockAPI and keydownevent. For the light part i tried to modify the part ones shader code to achieve what was asked. But sadly, i could not make the light position at the camera's location, so it stayes on the surface with cubes and when user presses left and right arrow keys it turns to left or right.

Since i did not have any classes i cannot fill the classes table.

Table 1: Methods

Method Name	Input(s)	Output(s)	Info
render	No input	-	Sends data to shaders.
createBuffer	data	Buffer	Creates buffers.
drawScene	scene	-	Draws scene.
perspective	fovy aspect near far	P	Create matrix.
mult	u v	result	multiplies vectors.
cross	u v	result	Cross product vectors.
subtractVec	u v	result	Subtracts vectors.
normalize	u	result	Normalizes vectors.
negate	u	result	Negates vectors.
loadTexture	gl loc	texture	Creates texture.
lookAt	eye at up	MV	Creates MV matrix.

3 Conclusion

I have learned how to create multiple objects with different textures and a movable camera, but i could not add the wanted head light. Similar codes can be found in our book at [1] and [3].

References

[1] Edward Angel and Dave Shreiner. Interactive computer graphics. https://www.interactivecomputergraphics.com/, 2020. Accessed: 16-11-2020.

[2] md. Mozilla developers. https://developer.mozilla.org/en-US/, 2020. Accessed: 16-11-2020.

[3] webgl2. Webgl2 fundamentals. https://webgl2fundamentals.org/, 2020. Accessed: 16-11-2020.