BBM414 - Experiment 3

Yunus Emre Akgün, 21726875

Hacettepe University Department of Computer Engineering

b21726875@cs.hacettepe.edu.tr

November 22,2021

Introduction

In this project we will implement some basic webGl2 fundemental functions and functional component over GUI . Individual transformations of points and polygons in space in WebGL are handled by the basic transformation matrices like translation, scale, and rotation. These matrices can be composed together and grouped in special ways to make them useful for rendering complicated 3D scenes. We have to task to complete one of firstly we will change color of object and we will add spin animation to this shape then we add scale aniamtion,spring animation and spin animation continouly.

Experiment

Part1

In the Part1, Fort this part we have to change vertex shader and fragment shader to achive desired result .First we need to change given squeare to triangle.to make reach this shape ı gave diffrent paramaters to drawing function such as we cab use GL_LINE_LOOP to make that shape succesfully.Then we reach empty triangle with random color.I added some new variables to change color of shape and rotataion direction of shape according to user input.to change rotation angle ı added "**uniform float theta**" variable according when user press the button the tetha will change continously so the shape will rotete own axis and color will change when user press the Color button if user press the Toggle button the boolean variable will visa versa and rotation direction of shape will turn on other direction.To increase speed of the animation, I add button and speed variable. If the you click the button, the speed variable increases and the you can observe that speed of animation will increase.Same thing will valid for slow speed of animation.Amd lastly ı added to toggle button the change direction of shape.

Part2

In this part we need to make three animation and all of them work together if user wants.Firstly ı need to change vertex and fragment shader to achive correct result.
We need three variable to do this these are “transformation_matrix”,”scale_matrix” and “rotation matrix” when user chnage the value of input fields all of them will change and requestAnimationFrame function will render everytime which the frame updated.
scale_matrix will update size of shape given interval which is [0.5,1.5] when shape reach this edge then visa-versa the scale varible changes so we can reach the first step then we will use transofrmation_matrix and rotation_matirx to give shape to spiral and spin animation .When one of the matrix change

```
gl_Position = transformatiom_matrix * rotation_matrix * scale_matrix * vec4(a_position, 0.0, 1.0);
```

according to given equation shape position will be updated and rendered.