

**CSED451 COMPUTER GRAPHICS**

**ASSIGNMENT 1**

2D DRAWING

SUBMITTED BY: ONG WEI HUA (49003139, ongweihua)  
 TAN WEI XUAN (49003140, tanweixuan)

TEAM NAME: SINGAPORE PEOPLE

DEPARTMENT: DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SUBMITTED TO: PROF LEE SEUNG YONG

SUBMISSION DATE: 15 MARCH 2019

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**2019**

# PROGAMMING ENVIRONMENT

The Programming Languages used are as follow:

* *FreeGlut 3.0.0-2*
* *GLEW 2.1.0*
* *GLM 0.9.9.1*
* *C++*
* *OpenGL & GLSL in Windows*

The Integrated Development used is

* *Microsoft Visual Studio 2007*

The Source Control Platform that used is

* *GitHub*

# FUNCTIONALITY OF THE PROGRAM

# DESIGN AND IMPLEMENTATION

# BRIEF EXPLANATION OF THE PROGRAM

# PROBLEMS FACED

There are several problems that we have faced while we are doing the programming assignment one for this.

Firstly, as we are new to coding in OpenGL, we are not familiar with the syntax of how to code an OpenGL program. Despite the both of us having the programming background knowledge, the languages, C++ and OpenGL programming, are a relatively new concept to us. We faced difficulties in understanding the syntax for OpenGL, and in order to grasp the concept of OpenGL programming, we had to learn through reading and watching online tutorials. Secondly, the drawing of the different shapes of the characters and ball was another problem we faced. We had to make sure the coordinates of each object are at the position that we want it to be at and making sure that is reflected correctly whenever the window is clipped or resized. To learn how to make the right shape correctly, we had to learn from an online tutorial that teaches how to make a right shape for OpenGL programming.

Thirdly, the clipping window function that is required by the assignment was difficult to implement as we are not sure how to do the clipping windows with the window following the ball when it moves. We had to read up and research on how the clipping windows works in OpenGL to get the windows moving with the ball. From the class, we are taught that the clipping windows are only showing a portion of the window without the whole world coordinates. We adapt the method of what we had learnt and coupled it with the tutorial to create the clipping window that is required by the assignment. Lastly, calculating the velocity of the ball moving speed and direction of the ball requires some mathematics calculation. We learnt it by setting a certain speed to the ball and keeping it constant despite hitting the obstacles.

# IMPROVEMENT TO PROGRAM

Firstly, we would like to make the characters have some jump functions without having to wait for the ball to “come” to them to bounce off them. With the jump functions, it can help to make a difference to the game play such as the direction of the ball can be changed accordingly without following a fixed direction of bouncing. Secondly, the score board can be implemented directly in the middle of the window where the score board is more visible than the current one. The current one is that it keeps track the score of each player at their own side of the field. Having it in the middle will allow a better overview of the score and easily for the player to see it. The score board will have a boundary to it so that the ball does not travel into the score board which makes the ball invisible to the player. Next, we could make it more interactive for the AI by having some random speeches when it plays like encouraging words for the player whenever they win or lose a point. The speech will be generated with a pre-defined set of phrases and set to use the phrases at certain point differences is too far or whenever the player scores a goal.

# CONCLUSION

# In summary, we have learnt how to use OpenGL with C++ and developed a simple 2D game with OpenGL. As we did not have a lot of programming background with C++, we have learnt how to use C++ along the way with OpenGL through the various video tutorials. We learnt about how to use the various functions in OpenGL from the lectures and tutorials to get our 2D game running. As creating a 2D game from scratch was tough, it was a valuable experience to start coding using OpenGL.

# REFERENCES

http://lazyfoo.net/tutorials/OpenGL/index.php

https://www.ntu.edu.sg/home/ehchua/programming/opengl/CG\_Introduction.html4

http://www.codersource.net/2011/02/06/a-simple-2d-game-with-opengl-ball-with-bat/

https://gamedev.stackexchange.com/questions/23672/determine-resulting-angle-of-wall-collision