UNIVERSITÉ Concordia UNIVERSITY

ACADEMIC YEAR: 2020-2021

PROJECT

Project Posted: July 30, 2021

Project Due: August 16, 2021, before 11.59pm

Late Submission: Not Allowed

Description:

The goal of this project is to enhance your understanding of computer graphics principles and your graphics programming skills. You will do this by extending your PA1 and PA2 code to design and implement a project, which emphasizes certain aspects of computer graphics.

Your team can choose from one of the following project themes briefly described further. While you MUST choose from one of the suggested themes only, you are expected to make improvisations of your own within your chosen project topic.

On project completion (last week of the course), you must submit a written report of at least six pages, covering what your objective was, why it interested you, how you achieved your objective, what you learned as a result, and the list of references and resources that you used.

You will also have to present/demo your project to instructor and TAs, in the prearranged time slot. The presentation will be a live-demo through Zoom and all the team members must be present.

Project Topics:

1. SuperHypercube Game:

The goal of this project is to create an interactive SuperHypercube game (gameplay video is available at https://www.youtube.com/watch?v=54bpnxLlmZQ) using OpenGL.

- You must have at least four distinct objects which should appear in a random order with varied orientations.
- You must have a timer to keep track of time which should be visible in the top right corner and score information in the top left corner.
- You must also have a way to rotate the object and to check whether that orientation is correct to let the object pass through the wall. There must be only a single correct orientation possible for any object to pass through the wall.

- Shadows and lighting are mandatory.
- You must also have textures, sound, and at least one imported 3D model.

You are also allowed to use third party libraries such as irrKlang, DeviL, and AssImp, etc. for sound, images, and 3D assets (apart from the cube itself).

2. Sliding Puzzle Game

The goal of this project is to create sliding puzzles to be placed on various faces of a cube using OpenGL.

You may refer to video available at: https://www.youtube.com/watch?v=Jrhh68CHheE for information on sliding puzzle. You must create at least a 3x3 puzzle on each face of the cube (one puzzle per team member, at least four puzzles are required). You must have a timer as well as score functionality similar to SuperHypercube. Sound as well as shadows, lighting, etc. are mandatory.

3. Song OR Story Narrative:

The goal of this project is to create a 5-minute song/story narrative, say a nursery rhyme. This narrative must be visually appealing, must involve some animation, and could involve some user interaction. The choice of the song/story is left up to you and you may use assets and/or libraries like in the above-mentioned topics.

You may refer to videos available at: https://www.youtube.com/watch?v=AX4mvhrrMQA and https://www.youtube.com/watch?v=Bcu8k_8LTxY for some inspiration as well as for the use of your models from PA2.

Submission:

Project must be submitted through Moodle. No other form of submission will be considered. Please create a zip file containing your C/C++ code, vertex shader(s), fragment shader(s), a readme file (.txt). The zip file should be named Project#_YourTeamID. In the readme file document, the features and functionality of the application, and anything else you want the grader to know *i.e.* control keys, keyboard/mouse shortcuts, *etc.*

Evaluation Procedure

You MUST demonstrate your program to the instructor and TAs during a pre-scheduled zoom session. All the team members must be present during the chosen timeslot.

You must run your submitted code, demonstrate its full functionality, and then answer questions about the OpenGL programming aspects of your solution. Major marking is done on the spot during the demonstration. Your code will be further checked for structure, non-plagiarism, *etc.* However, ONLY demonstrated submissions will receive marks. Other submissions will not be marked.